



west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Phone: 304/926-0475 • Fax: 304/926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

Evaluation Memo

Application Number:	PD16-068
Facility ID Number:	099-00009
Name of Applicant:	Ashland LLC
Name of Facility:	Neal Plant
Location of Facility:	Kenova, Wayne
Latitude/Longitude:	38.368235/-82.593903
Application Type:	Permit Determination
Submission Date:	November 21, 2016
Complete Date:	December 20, 2016
Due Date:	January 31, 2017
Engineer:	Joe Kessler

Background Information

On November 21, 2016, Ashland LLC (Ashland), submitted a Permit Determination Form (PDF) for proposed changes at the Neal Plant located near Kenova, Wayne County, WV. Ashland is requesting concurrence that a project to replacement the reactor vessel D-210 in the maleic anhydride (MAN) process line is not defined as a “modification” or as a “major modification” under 45CSR13 and 45CSR14, respectively.

Description of Proposed Changes

There are currently four (4) existing reactors at the facility (D-208 through D-211). The reactors take the raw material inputs (butane and ambient air) and react them with a proprietary vanadium-phosphorous catalyst to make crude MAN. The four reactors operate in parallel, each accounting for approximately 25% of total MAN production. However, total MAN production is

not limited by the four reactors' maximum potential throughput, but is instead bottlenecked by the compressors that provide air (a raw material) into the reactors. The reactors are capable of producing more MAN than they can with current compressed air limitations (compressors are the bottleneck restricting production). Using all four existing reactors, Ashland is producing all the MAN that they can, given the compressor air limitation.

Ashland has proposed the replacement of the D-210 reactor in the MAN line with a like-kind unit. No other physical or process changes were proposed. This change, as described above, will not allow for any increase in the production of MAN due to the limited amount of air that can be introduced into the process.

Air Emissions and Calculation Methodologies

Emissions from all four reactors are aggregated and controlled by both thermal oxidation (B-800) and a scrubber (D-330). These emission points (11E and 13E, respectively) are currently limited in the under A.2 of the permit. There was no request to increase the emission limits under A.2 as a result of this replacement.

Determination of Permit Applicability

As the Ashland Neal Plant is defined under 45CSR14 as a "major stationary source" (see below), the following will evaluate the potential permit applicability of the proposed changes under both 45CSR13 and 45CSR14.

45CSR13

Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the . . . modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to . . . modify." The definition of "modify" is given under Section 2.17 of 45CSR13 and primarily defines various emission levels that would define any proposed changes as a modification and require Ashland to get a permit prior to beginning construction. Based on the fact that this reactor replacement project will not increase any potential emissions from the facility, the proposed changes do not exceed any of the modification thresholds under §45-13-2.17.

Additionally, the definition of "stationary source" under Section 2.24 of 45CSR13 includes in the definition any facility that "is subject to any substantive requirement of an emission control rule promulgated by the Secretary." Based on long-standing DAQ policy and the "dual-definition" of a source, this test is also applied to proposed changes to determine if they meet the definition of modification. However, in the case of the determining if proposed changes are defined as a "modification," the changes to the equipment must *trigger* an emission control rule. As a result, it is self-evident that any existing rule applicability to the currently installed reactor vessel will continue to apply to the new reactor and no new rules shall be triggered by the proposed replacement.

45CSR14

The Neal Plant is an existing major stationary source under 45CSR14 and the reactor replacement project is considered, pursuant to §45-14-2.40, a “*physical change* or a change in the method of operation.” Therefore, to determine if the project is defined as a “major modification,” pursuant to §45-14-3.4(a), the project is examined under a two-step applicability test: “[A] project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases -- a significant emissions increase (as defined in subsection [§45-14-2.75]), and a significant net emissions increase (as defined in subsections [§45-14-2.46] and [§45-14-2.74]). The proposed project is not a major modification if it does not cause a significant emissions increase. If the proposed project causes a significant emissions increase, then the project is a major modification only if it also results in a significant net emissions increase.”

Therefore, for the proposed changes to meet the definition of a major modification, the changes themselves must result in a significant emissions increase. The methodology for calculating the emissions increase under the first step is given under Sections §45-14-3.4(b), 3.4(c), 3.4(d) and 3.4(f). The substantive language relevant to the changes evaluated herein is given below:

[§45-14-3.4(b)]

The procedure for calculating (before beginning actual construction) whether a significant emissions increase (i.e., the first step of the process) will occur depends upon the type of emissions units being modified, according to subdivisions 3.4.c through 3.4.f.

[§45-14-3.4(c)]

Actual-to-projected-actual applicability test for projects that only involve existing emissions units. -- A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions (as defined in subsection 2.63) and the baseline actual emissions (as defined in subdivisions 2.8.a and 2.8.b), for each existing emissions unit, equals or exceeds the significant amount for that pollutant (as defined in subsection 2.74).

Baseline actual emissions for existing non-Electric Generating Units (EGUs) are, as noted above, defined under §45-14-2.8(b):

[§45-14-2.8(b)]

For an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Secretary for a permit required under this rule, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.

Projected actual emissions are defined extensively under §45-14-2.63, however, under 2.63(a)(4), it states that “In lieu of using the method set out in paragraphs 2.63.a.1 through 2.63.a.3, [the applicant] may elect to use the emissions unit’s potential to emit, in tons per year, as defined under subsection 2.58.” It is also important to note, that for the purposes of the PSD applicability analysis, the new reactor is defined as a “replacement unit” under §45-14-2.27(b) which allows it to use the calculation procedures established for existing units.

Based on the above requirements under 45CSR14, Ashland submitted with the PDF an actual-to-potential 45CSR14 applicability analysis for the proposed reactor replacement project. The applicability test was performed for reactor D-210 only, and did not include the other reactors in parallel with it. Based on this plant set-up, Ashland has stated: *“Because total MAN production is not limited by the 4 Reactors, but is instead limited by the compressors that provide air into the Reactors, the replacement of Reactor D-210 will have no effect on total MAN production, or on material throughputs at upstream or downstream locations. Also, because the replacement of Reactor D-210 will have no effect on total MAN production, this Reactor can be considered as a stand-alone air emissions unit. . .”* The writer concurs this is reasonable based on the set-up of the reactors in parallel with no significant downstream de-bottlenecking as a result of the compressed air limitation.

Baseline actual emissions were based on annualized MAN production recorded from the 24-month period of April 2013 to March 2015. The emission factors used to calculate the baseline actual emissions were taken from CEMS data, as calculated based on MAN production, stack testing, and mass balance. Control efficiencies of 95% and 99% were applied to uncontrolled CO and VOC emissions, respectively. Potential emissions from the new reactor were based on same emission factors as used for the actual emissions and were further based on the maximum production capacity of the proposed new reactor D-210. Based on the above methodology (see the information included in the PDF for detailed calculations), the following table summarizes the actual-to-potential applicability test:

Table 1: PSD Applicability Analysis (in tons/year)

Pollutant	BAE	PTE	Difference	PSD Threshold ⁽¹⁾	45CSR14 Applicability?
CO	119.57	210.26	90.69	100	No
NO _x	0.16	0.24	0.08	40	No
SO ₂	0.05	5.74	5.69	40	No
VOCs	11.42	23.51	12.09	40	No

(1) §45-14-2.74(a).

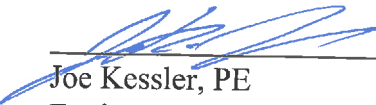
Therefore, under Step 1 of the PSD Applicability Analysis as given pursuant to §45-14-3.4(a), the proposed reactor replacement project is not defined as a “major modification” under 45CSR14.

Summary and Recommendation

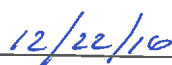
Based on the information provided in the PDF, I recommend the issuance of a “no permit needed” letter to Ashland LLC for the proposed reactor replacement project at their Neal Plant based on the following:

- The reactor replacement project will not trigger a substantive requirement of an emission control rule promulgated by the Secretary;

- There is no increase in the potential-to-emit (PTE) of the facility as a result of the reactor replacement project; and
- The reactor replacement project is not defined as “major modification” under 45CSR14.



Joe Kessler, PE
Engineer



Date